LISTING OF THE CLAIMS

1.-34. (canceled)

35. (currently amended) A device for detecting ionizing radiation, comprising: an array of wires embedded in ~~the material of claim 1~~ a solid organic semiconducting material consisting essentially of a π-conjugated material having an electrical resistivity of at least 10^9 ohm-cm, the array comprising a first ~~set~~ plurality of parallel spaced apart wires intersecting orthogonally with a second ~~set~~ plurality of parallel spaced apart wires, wherein each wire in the first plurality intersects with each wire in the second plurality; and means for supplying power to the array.

36. (currently amended) The device of claim **35**, wherein the wires in each array are spaced at a distance of from 10μm to 100μm apart.

37. (currently amended) A device for detecting ionizing radiation, comprising: a plurality of layers joined together to form a multilayer stack, wherein each layer comprises an array of wires embedded in ~~the material of claim 1~~ a solid organic semiconducting material consisting essentially of a π-conjugated material having an electrical resistivity of at least 10^9 ohm-cm, the array comprising a first ~~set~~ plurality of parallel wires intersecting orthogonally with a second ~~set~~ plurality of parallel wires; and means for supplying power to each array.

38. (currently amended) The device of claim 37, wherein the wires in each array are spaced at a distance of from 10μm to 100μm apart.

39. (canceled)

40. (currently amended) A device for detecting ionizing radiation, comprising:

a pair of electrodes, each having a length and width, wherein the length is greater than the width;

a solid organic semiconducting material consisting essentially of a π-conjugated material having an electrical resistivity of at least 10^9 ohm-cm disposed between said electrodes,

wherein the combination of electrodes and π-conjugated ~~polymer~~ material is rolled up along their length to form a generally cylindrical-shape structure; and

means for providing power to said electrodes.

41.-46. (canceled)

47. (currently amended) ~~The material~~ The device as in any one of claims ~~1~~, ~~3~~, ~~12~~, ~~24~~, **35**, **37** and **40** wherein an external stress is applied to the π-conjugated material by stretching ~~the π-conjugated material to strain and orient the polymer chains~~.

48. (currently amended) The device of claim **47**, wherein the external stress is applied at a temperature above the glass transition temperature of the material and below the melting temperature.

49. (canceled)

50. (currently amended) A device for detecting ionizing radiation, comprising:

electrodes, wherein said electrodes are ~~composed of~~ silicon wafers having prefabricated pulse detection circuitry patterned thereon;

~~the material of claim 1~~ a solid organic semiconducting material consisting essentially of a π-conjugated material having an electrical resistivity of at least 10^9 ohm-cm disposed between said electrodes; and

power supply means for providing power to said electrodes.

51. (currently amended) A method for detecting ionizing radiation, comprising:

providing an array of wires embedded in ~~the material of claim 1~~ a solid organic semiconducting material consisting essentially of a π-conjugated material having an electrical resistivity of at least 10^9 ohm-cm, the array comprising a first ~~set~~ plurality of parallel spaced apart wires intersecting orthogonally with a second ~~set~~ plurality of parallel spaced apart wires, wherein each wire in the first plurality intersects with each wire in the second plurality;

supplying electric power to the array;

inserting the array into a radiation field; and

detecting the signal generated when radiation strikes the wires.

52. (**previously presented**) The method of claim **51**, wherein the array is a multilayer array.

53. (**new**) The device as in any one of claims **35** or **37**, wherein the wires are electrically conducting oxides, electrically conducting polymers or combinations thereof.

54. (**new**) The device of as in any one of claims **35**, **37**, **40**, and **50** wherein the π-conjugated material comprises a mixture of π-conjugated materials.

55. (**new**) The device of claim **54**, wherein the π-conjugated material includes π-conjugated polymers having long chains of alternating single and double carbon-carbon bonds, polyaromatic hydrocarbons, or quinolates.

56. (**new**) The device of claim **55**, wherein the π-conjugated polymers are selected from the group of polymers consisting of polyacetylenes, polypyrroles, polyfluorines, and derivatives and combinations thereof.

57. (**new**) The device of claim **56**, wherein the derivative π-conjugated polymer is selected from the list of polymers consisting of poly(1-methoxy-4-(2-ethylhexyloxy)-2,5-phenylenevinylene), poly(2,5-dioctyloxy-p-phenylenevinylene), poly(3,4-ethylene dioxythiophene), and poly(3-octylthiophene), and combinations thereof.

58. (**new**) The device of claim **55**, wherein the polyaromatic hydrocarbons include naphthalene, anthracene, or rubrene.

59. (**new**) The device of claim **55**, wherein the π-conjugated polymers are mixed with organic polymers.

60. (**new**) The device of claim **59**, wherein the organic polymers include polystyrene or poly(methyl methacrylate).

61. (**new**) The device as in any one of claims **35**, **37**, **40** and **50** wherein a metal is incorporated into the structure of the π-conjugated material.

62. (**new**) The device of claim **61**, wherein the metal is aluminum, gallium, boron or lithium and salts thereof.

63. (**new**) A method for tracking 1-10 MeV particles, comprising;

providing a plurality of layers, wherein each layer consists of an array of wires embedded in a solid organic semiconducting material consisting essentially of a π-conjugated material having an electrical resistivity of at least 10^9 ohm-cm, the array comprising a first plurality of parallel spaced apart wires intersecting orthogonally with a second plurality of parallel spaced apart wires, wherein the parallel wires in each array are spaced at a distance of between 10-100 μm apart and wherein each wire in the first plurality intersects with each wire in the second plurality;

supplying electric power to the array;

inserting the array into a radiation field; and

detecting the signal generated when radiation strikes the wires.

64. (**new**) A method for tracking 1-10 MeV neutrons, comprising:

providing a plurality of layers, wherein each layer consists of an array of wires embedded in a solid organic semiconducting material consisting essentially of a π-conjugated material having an electrical resistivity of at least 10^9 ohm-cm, the array comprising a first plurality of parallel spaced apart wires intersecting orthogonally with a second plurality of parallel spaced apart wires, wherein the parallel wires in each array are spaced at a distance of between 10-100 μm apart and wherein each wire in the first plurality intersects with each wire in the second plurality;

supplying electric power to the array;

inserting the array into a radiation field; and

detecting the signal generated when radiation strikes the wires.

65. (**new**) A method for detecting d,t reactions, comprising:

providing a plurality of layers, wherein each layer consists of an array of wires embedded in a solid organic semiconducting material consisting essentially of a π-conjugated material having an electrical resistivity of at least 10^9 ohm-cm, the array comprising a first

plurality of parallel spaced apart wires intersecting orthogonally with a second plurality of parallel spaced apart wires, wherein the parallel wires in each array are spaced at a distance of between 10-100 μm apart and wherein each wire in the first plurality intersects with each wire in the second plurality;

supplying electric power to the array;

inserting the array into a radiation field; and

detecting the signal generated when radiation strikes the wires.